BEFORE THE
PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NOS. 2021-143-E & 2021-144-E

In the Matters of: Application of Duke Energy Progress, LLC for Approval of Smart $aver Solar as Energy Efficiency Program Application of Duke Energy Carolinas, LLC for Approval of Smart $aver Solar as Energy Efficiency Program	**REBUTTAL TESTIMONY OF TIMOTHY DUFF FOR DUKE ENERGY PROGRESS, LLC AND DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Timothy J. Duff, and my business address is 400 S Tryon Street, Charlotte, North Carolina.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Business Services LLC as General Manager, Grid Strategy Enablement. I am responsible for the development of strategies and policies related to the implementation of energy efficiency and other retail products and services that create customer and utility system value. I also oversee the analytics functions associated with evaluating and tracking the performance of Duke Energy Corporation's ("Duke Energy") Integrated Grid Solution retail products and services. My responsibilities cover all of Duke Energy's utility operating companies, including Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP" and together with DEC, the "Companies")

Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THESE PROCEEDINGS?

A. Yes, I did.

Q. ARE YOU INCLUDING ANY EXHIBITS IN SUPPORT OF YOUR REBUTTAL TESTIMONY?

A. Yes, I am including two exhibits in support of my rebuttal testimony. Duff Rebuttal Exhibit 1 consists of my resume, which I have attached to provide additional information regarding my background and experience. Duff Rebuttal Exhibit 2 consists of S.C. Code Ann. § 58-37-20, which I have attached for ease of reference to South Carolina's statutory authority for energy efficiency ("EE") and demand-side management ("DSM") programs.

Q. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes.

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. My principal points in rebuttal are as follows:

1. The Office of Regulatory Staff's ("ORS") Witness Horii's opinion of what should and should not fit under programs provided for under S.C. Code Ann. § 58-37-20 does not square with the language of that statute. The statute specifically includes under its umbrella of authorized measures "energy supply" technologies, even if those technologies are not traditional EE programs. Further, the Commission recently and explicitly found that all self-consumed generation is "equivalent to energy efficiency or demand-side management measures as a decrement to system load." Order No. 2021-569 at 9-10, Docket No. 2019-182-E (Aug. 19, 2021).
2. Witness Horii ignores the fact that the Total Resource Cost ("TRC") cost-effectiveness test is no longer the determinative test for EE/DSM programs in South Carolina pursuant to a Commission-approved settlement the ORS entered into in December 2020. The Companies' transition from the TRC to the Utility Cost Test ("UCT") for determining program cost-effectiveness was approved by Commission orders issued in January 2021,[1] and then reaffirmed by the Commission in the Companies' Integrated Resource Planning proceedings.[2] In addition to the UCT now being the determinative cost-effectiveness test for EE/DSM programs, the

[1] Commission Order Nos. 2021-32 and 2021-33.
[2] Commission Order No. 2021-447.

UCT is the most useful test to be used in these proceedings because it considers the program from the perspective of a utility investment on behalf of customers in a demand-side resource compared to the costs of a supply-side investment made by a utility on behalf of customers.

3. Witness Horii unduly focuses on what he characterizes as "shareholder incentives" and apparently does not understand that utility incentives for EE/DSM programs are explicitly required by S.C. Code Ann. § 58-37-20 and authorized by the EE/DSM Mechanisms created by the December 2020 settlement between the Companies and ORS. Further, such incentives are only a small portion of the savings that result from the EE/DSM program.

4. Witness Horii completely misrepresents the anticipated free-ridership of the Companies' proposed Smart $aver Solar as EE Programs (collectively, the "Program") and bases his free-ridership figures on a totally inapplicable baseline, rendering his apples-and-oranges free-ridership calculation incorrect and uninformative.

5. ORS Witness Morgan improperly focuses on the costs of the Program and totally ignores the Program's benefits. By doing so, Witness Morgan misconstrues how EE/DSM programs operate, which is by reducing certain electricity production, capacity, and transmission and distribution ("T&D") costs, which are reflected in the reduction of base rates and other cost recovery clauses in the future.

6. While Witness Morgan asserts that the Companies' solar programs are "sufficient and adequate" to encourage the adoption of residential solar photovoltaic ("PV") systems, such a perspective totally misses the point of cost-effective EE/DSM

programs. The intent is not to be satisfied with "sufficient and adequate," but to incentivize customer adoption of the EE/DSM measure (in this case, residential PV) because doing so reduces costs for all customers.

II. THE PROGRAM FITS SQUARELY UNDER SOUTH CAROLINA'S EE/DSM STATUTE.

Q. WHAT IS THE ULTIMATE PURPOSE OF EE/DSM PROGRAMS?

A. The ultimate purpose of EE/DSM programs is to cost-effectively reduce grid energy usage. The terms "energy efficiency" and "demand-side management" are not defined terms under the Commission-approved Mechanisms, nor under S.C. Code Ann. § 58-37-20. S.C. Code Ann. § 58-37-20, however, casts a very wide net for cost-effective EE/DSM programs. Contrary to Mr. Horii's suggestions, the statute does not limit such programs to narrow definitions that turn on *where* the energy savings occur, instead referring generally to "energy supply and end-use technologies." I have attached this code section to my testimony for ease of reference as Duff Rebuttal Exhibit No. 2. The focus of demand-side programs on reducing grid energy usage is further supported by the Commission-approved cost-effectiveness test—UCT—which evaluates EE/DSM programs based on a comparison between (1) the utility's avoided electricity production, capacity, and T&D costs, and (2) the costs of the program. This analysis is exclusively focused on reductions in grid energy usage, and this is precisely what the Program proposed in these proceedings would achieve. Fully consistent with this perspective is the Commission's recent directive that behind-the-meter generation used by customer-generators "be treated as energy efficiency or demand-side resources." Order No. 2021-569 at 52, Docket No. 2019-182-E (Aug. 19, 2021). This language from the Commission is similar to that of S.C. Code Ann. § 58-37-20, which includes the following in its list of demand-side measures: "energy

supply and end-use technologies that are cost-effective, environmentally acceptable, and reduce energy consumption or demand."

Q. DO YOU AGREE WITH WITNESS HORII THAT THE PROGRAM IS NOT A TRADITIONAL EE PROGRAM?

A. If the basis for Witness Horii's view that the proposed Program is "not a traditional" energy efficiency program is because an incentive for residential solar has not been offered in South Carolina as an EE program in the past, then, yes, I would agree. Witness Horii is correct that the Companies have not previously filed an application proposing to include an incentive for residential solar as part of an EE/DSM program. The fact is that the economics and market conditions associated with the technology did not previously support rooftop solar being considered for inclusion in the past. While there is no single definition of "energy efficiency," the proposed Program is certainly under the broader umbrella of demand-side programs authorized for implementation by the Companies through their respective suites of EE/DSM programs. As explained in the applications filed in these dockets, though given scant attention in ORS's testimony, the residential solar component of the Program would reduce grid energy usage, and the demand response component of the Program requires participation in the Companies' Bring Your Own Thermostat program (the "Winter BYOT Program"). Whatever you label the Program—EE, DSM, or something else contemplated in S.C. Code Ann. § 58-37-20—the fact of the matter is that the Program will reduce customers' grid energy usage more cost-effectively than the Companies building new supply side resources, which is a win for all customers.

Additionally, with the new paradigm in South Carolina including mandatory time-of-use rates for customer-generators, the Companies are now able to design EE/DSM

programs that, when coupled with the new Solar Choice rates and demand response programs as described in Witness Huber's rebuttal testimony, incentivize customer-generators to reduce their consumption and modify usage patterns, resulting in EE. The Commission recognized this new paradigm in Docket No. 2019-182-E when it determined that "all self-generation that is consumed by a customer-generator within the billing period is, from the system perspective, equivalent to energy efficiency or demand side management measures as a decrement to system load." Order No. 2021-569 at 9-10, Docket No. 2019-182-E (Aug. 19, 2021).

Q. DO AGREE WITH WITNESS HORII'S CONTENTION THAT THE COMPANIES' PROPOSED PROGRAM IS GENERATING ELECTRICITY AND THEREFORE IT SHOULD NOT BE CONSIDERED EE?

A. No. Witness Horii contends "Solar PV is a generation resource, not EE. A solar PV outputs electricity just like a combustion turbine, wind turbine, hydroelectric plant, diesel engine, etc." Horii Direct Testimony at p. 6, ll. 5-7. This statement demonstrates Mr. Horii's lack of understanding of the Companies' existing portfolio of EE and DSM programs and recovery mechanisms because it is not consistent with the portfolio and contradicts past support the ORS has shown for program incentives associated with Topping Cycle Combined Heat and Power ("CHP"), which, many times, are actually combustion turbines. By way of background, on February 23, 2018 in Docket Nos. 2013-298-E and 2015-163-E, the Companies filed requests with the Commission to modify their Nonresidential Smart $aver® Performance Incentive Program tariff, including proposing to add CHP eligibility

provisions under the program's guidelines.[3] The added provisions provide that "the energy efficiency associated with a newly constructed non-utility owned Combined Heat and Power ("CHP") system sited on a customer's premise will be eligible for consideration under the program." The ORS filed a letter in those dockets with the Commission on March 13, 2018, explicitly discussing the CHP-related provision and informing the Commission that it did not oppose the modification. ORS Letter, Docket Nos. 2013-298-E & 2015-163-E (Mar. 13, 2018) ("The modifications proposed for [the Nonresidential Smart $aver® Performance Incentive Program] include the addition of CHP eligibility provisions providing that the energy efficiency associated with a newly constructed non-utility owned CHP system sited on a customer's premise will be eligible for consideration under the program."). Through Order Nos. 2018-179 and 2018-181, the Commission approved the modification related to the eligibility of Topping Cycle CHP. Just as the reduction in energy consumption from the grid being evaluated under the proposed Program is associated with converting the sun's energy into electricity, the Nonresidential Smart $aver® Performance Incentive Program has recognized the reduction in energy consumption from the grid associated with the electricity generated from a Topping Cycle CHP unit.

It may be that Mr. Horii is not familiar with the South Carolina EE/DSM statute, the applicable EE/DSM Mechanisms, or with the Companies' prior EE/DSM filings. While ORS has historically used other witnesses to participate in the Companies' EE/DSM proceedings, I do not believe Mr. Horii has ever presented testimony in South Carolina on

[3] DEC Filing, Docket No. 2013-298-E (Feb. 23, 2018); DEP Filing, Docket No. 2015-163-E (Feb. 23, 2018).

these issues and may be unfamiliar with the framework and history of the Companies' EE/DSM Mechanisms and programs. Nevertheless, the Program proposed in this case is not unlike the CHP program previously proposed by the Companies, supported by ORS, and approved by the Commission.

Q. PLEASE RESPOND TO ORS WITNESS HORII'S CONCLUSION THAT THE SOLAR WATER HEATER TECHNOLOGY IS DISTINCT FROM THE PROGRAM PROPOSED IN THESE PROCEEDINGS.

A. The programs are more alike than Witness Horii suggests. Fundamentally, the Solar Water Heater program and the Program proposed in these proceedings both reduce customers' energy usage from the grid by using energy from the sun. While Mr. Horii attempts to focus on the distinction between solar PV generating electricity and solar water heaters warming water to use less electricity, both operate by harnessing solar energy for the purpose of reducing grid energy usage. Mr. Horii's view that using the sun's thermal energy to heat water and reduce consumption from the grid is somehow different than converting the sun's energy into electricity to reduce consumption from the grid is perplexing and seems to fly in the face of the very definitions of EE that he cites. One of the definitions that Mr. Horii relies upon from Environmental and Energy Study Institute is "Energy efficiency simply means using less energy to perform the same task – that is, eliminating energy waste."[4] The Companies' proposed Program comports with both components of this definition. First, just as the solar water heating eliminates the waste of the sun's thermal energy, the installation of rooftop solar PV also eliminates the waste of

[4] Environmental and Energy Study Institute, https://www.eesi.org/topics/energy-efficiency/description (last accessed Oct. 5, 2021).

energy coming from the sun. Second, installing solar PV will reduce grid energy consumption associated with the various tasks within an entire residential household.

Q. DO YOU AGREE WITH ORS WITNESS HORII THAT CLASSIFYING SOLAR PV AS EE WOULD DISTORT THE MAGNITUDE OF EE GOALS AND ACHIEVEMENTS?

A. No, and I'm not even sure such a position has any meaning. In making this statement, Mr. Horii essentially states that the Commission should reject a viable, cost-effective EE/DSM program because it would result in increased savings for the Companies' customers. I do not agree with this position. Witness Horii seems to ignore the overall goals and resulting savings from EE/DSM programs and opposes this Program because, in his view, it is not a "traditional" EE/DSM offering.

III. THE UCT IS THE DETERMINATIVE COST-EFFECTIVENESS TEST.

Q. DO YOU AGREE WITH WITNESS HORII THAT THE COMMISSION SHOULD BASE ANY PART OF ITS EVALUATION OF THE PROGRAM ON THE TRC TEST?

A. No. The Commission approved two settlement agreements in December 2020, one in Docket No. 2013-298-E as appliable to DEC and one in Docket No. 2015-163-E as applicable to DEP (the "Mechanism Settlement Agreements"), both of which the ORS entered into and supported. Within these Mechanism Settlement Agreements, parties agreed that, while the Companies will continue to provide the results of all four of the cost-effectiveness tests as they always have in the review of EE/DSM programs, the UCT would serve as the determinant screen in assessing cost-effectiveness for program approval. Regarding the process for approval of new programs, the Mechanism Settlement Agreements state that, "With the exception of Low-Income Programs or other programs

explicitly identified at the time of the application for their approval, all Programs submitted for approval will have a Program-level UCT result of greater than 1.00." Section 2 of the Mechanism Settlement Agreements goes on to explicitly require that "any new EE and DSM programs or proposed modifications to existing programs filed on or after January 1, 2021 will comport with the updated Mechanism such that any cost-effectiveness screening or cost recovery in 2022 will reflect the updated Mechanism." Another term of the Mechanism Settlement Agreements is that the Mechanisms be revisited in the year 2026. The Mechanism Settlement Agreements were approved for DEC and DEP through Order Nos. 2021-32 and 2021-33, respectively.

ORS itself has exclusively relied upon the UCT in its review of the Companies' program cost-effectiveness in recent EE/DSM rider filings. In the most recent EE/DSM rider proceedings for DEC and DEP, ORS discussed programs' cost-effectiveness exclusively under the UCT and what changes the Companies may need to implement to improve certain programs' UCT scores. ORS Report on Review of Duke Energy Carolinas, LLC's Application at 5-6, Docket No. 2021-76-E (May 14, 2021); ORS Report on Review of Duke Energy Progress, LLC's Application at 6 (Oct. 15, 2020). In these EE/DSM rider review proceedings, ORS relied exclusively upon the UCT as the determinative cost-effectiveness test and did not even mention the TRC.

ORS agreed in a Commission-approved settlement to transition from the TRC to the UCT and has been appropriately relying upon the UCT as the exclusive and determinative cost-effectiveness test. The Commission should not permit ORS Witness Horii to arbitrarily propose to utilize a different cost test to support his opposition thereby

"unwinding" the settlement that ORS entered into and relitigate what it settled less than a year ago.

Q. NOTWITHSTANDING THAT THE MECHANISMS REQUIRE THE USE OF THE UCT, DO YOU BELIEVE THE TRC IS AN APPROPRIATE COST-EFFECTIVENESS TEST FOR THE PROGRAM?

A. No. Witness Horii's desire to use the TRC as the determinant screen for EE and DSM programs ignores the UCT's fundamental benefit of evaluating the program costs that would be passed on to ratepayers and compares them to the benefits of avoided costs of implementing the program. Those avoided costs will directly benefit all customers through lower system costs over time and hence reduced rates, even though the EE/DSM rider itself will increase. Additionally, his contention ignores the following rationale as discussed in DEP's application to revise its Mechanism:

> First moving from TRC to UCT will mitigate the severity of the unintended negative impact that advancement of energy efficiency codes and standards can have on the cost effectiveness of an efficiency measure.
>
> Second, the adoption of the UCT will give the Company more capability to respond to changes in the market and avoided costs by allowing a change to the financial incentive that it pays to customers for an efficiency measure to impact the cost effectiveness of the measure.
>
> Finally, the move to UCT will ensure that the energy efficiency benefits achieved by a program for the utility system are greater than the cost to the utility system to offer that program.

DEP Application at 5, Docket No. 2015-163-E (June 26, 2020).

Q. ON PAGE 16, LINES 14-16, WITNESS HORII EXPLAINS THAT OF THE FOUR STANDARD COST TESTS ONLY THE TRC EVALUATES THE IMPACT OF AN EE/DSM PROGRAM ON ALL CUSTOMERS. IS THAT CORRECT?

A. That is technically true only if you consider all customers "as a whole." There is no single test of cost-effectiveness that ensures an EE/DSM program benefits "all customers" when that is defined as each individual group of participating and non-participating customers. A TRC ratio above 1.0 does not necessarily mean that an EE/DSM program benefits both groups of customers (i.e., participants and non-participants). For example, a program that is good for participants, but bad for non-participants, can still have a TRC greater than 1.0 if the benefit to participants outweighs the cost to non-participants. That is, TRC allows for winners and losers and is not the holistic view that Witness Horii represents. The approach included in the Mechanism Settlement Agreements has the Companies prepare the results for all four tests allows stakeholders to understand whether the program is cost-effective from the unique perspectives of the participants, non-participants, and the utility. The TRC is in fact a conglomerate measure, but that does not mean it should be considered a better measure of cost-effectiveness of EE programs or even an accurate way to say that all customers benefit.

Q. ON PAGE 30, LINES 14-16, WITNESS HORII DISCUSSES HOW THE PROGRAM'S ELIGIBILITY REQUIREMENT TO PARTICIPATE IN THE WINTER BYOT PROGRAM WAS TREATED IN THE COST-EFFECTIVENESS ANALYSIS. DO YOU AGREE WITH HIS CONCLUSION?

A. Mr. Horii's testimony states, "The benefits of BYOT participation could be included, but if they were, the costs associated with the program would also need to be included. The current proposal by the Companies excluded both the benefits and costs of the BYOT program, which is a reasonable approach as well." Mr. Horii's statement is correct, the cost-effectiveness analyses performed by the Companies contained neither the benefits nor

the costs associated with the Winter BYOT Program. The Companies chose to exclude the costs and benefits of the Winter BYOT Program because it is a pre-existing standalone program, but as Mr. Horii points out, the Companies could have included the Winter BYOT Program so long as they also included both the benefits and costs. Had the Companies included the costs and benefits of the Winter BYOT Program, the proposed Program's cost-effectiveness would have been even higher for UCT and the other three tests. In fact, when the avoided costs benefit and program costs are summed across DEC and DEP to provide a holistic South Carolina view, the combination of BYOT and the proposed Program passes all of the cost-effectiveness screens as shown below:

Smart $aver Solar with BYOT			
Test	**DEC-SC**	**DEP-SC**	**Total DEC SC and DEP SC**
UCT	2.88	2.06	2.75
TRC	1.03	0.85	1.00
RIM (Net Fuel)	1.31	1.0	1.26
Participant	0.99	1.11	1.01

Q. DID THE COMPANIES MAKE ANY ASSUMPTION IN THEIR COST-EFFECTIVENESS ANALYSES THAT COULD HAVE RESULTED IN THE COMPANIES UNDERESTIMATING THE TRC TEST RESULTS?

A. Yes, the Companies' cost-effectiveness analysis assumed that all of the customer out-of-pocket costs associated with the solar investment were incurred in the year of installation. The reality, as discussed by Witness Huber, is that many of the Program participants will be solar leasing or financed customers. If customer costs are spread out via a lease or loan with a financing rate lower than the Companies' discount rate, rather than being incurred in the year of installation, then the TRC results would be higher.

Q. PLEASE RESPOND TO ORS WITNESS HORII'S ALLEGATION THAT THE COMPANIES OVERESTIMATED THE T&D PEAK REDUCTION PROVIDED BY SOLAR PV AND, THEREFORE, SOLAR PV'S T&D BENEFITS.

A. First, again, per the Mechanism Settlement Agreements that ORS entered into, the TRC is no longer determinative for purposes of the Companies' EE/DSM cost-effectiveness evaluation. Nevertheless, Mr. Horii is incorrect that the Companies' accounting for peak reduction overestimated the avoided T&D benefits used in cost-effectiveness evaluations. Mr. Horii's contention seems to be based again on a lack of knowledge and understanding of the EE/DSM Recovery Mechanisms that are in place and used with the Companies' EE/DSM programs. The methodology used in the determination of avoided costs associated with avoided T&D applies the approved system average avoided T&D rate to the amount of coincident peak savings associated with the average savings for a participant installing a specific EE/DSM measure. While looking at specific circuit level data to project the avoided costs could result in different avoided T&D benefits in the assessment of cost-effectiveness, it would add a significant new assumption and variability into the assessment of cost-effectiveness. Additionally, a new specific circuit avoided T&D rate would need to be derived in lieu of using the current system average rate that has historically applied to the system average reduction to the coincident peak associated with EE savings. Mr. Horii ignores that all other EE and DSM program measures are located on specific circuits and would require similar treatment. The reality is that the Companies applied the approved methodology for determining avoided T&D costs associated with EE and DSM programs which, until this case, has never been questioned by the ORS or any other party in South Carolina.

Q. DO YOU AGREE THAT SOLAR PV INTEGRATION COSTS SHOULD BE INCLUDED IN THE EVALUATION OF THE PROGRAM'S COST-EFFECTIVENESS?

A. No. First, as Mr. Horii points out, solar integration costs are not costs that would be factored into the calculation of the UCT, as they would be costs borne by the customer installing solar not the utility. With that said, the solar integration costs being discussed are not related to the self-consumption demand-side component of solar, but rather would be related to the NEM component (supply-side of solar installations) as Mr. Horii points out when he states, "It is worth noting that the SISC was developed based on a focus on utility-scale solar PV generators, not behind-the-meter residential solar customer-generators." The Companies believe that the type of solar integration costs that would be associated with residential rooftop PV would need more study and have likely been appropriately reflected in the time varying rates that were proposed as part of the Solar Choice Metering tariffs and riders and hence were reflected in the cost-effectiveness analysis, as those rates were used in the calculation of the RIM and Participant Cost tests.

IV. SOUTH CAROLINA LAW EXPLICITLY REQUIRES INCENTIVES FOR DSM PROGRAMS.

Q. WITNESSES HORII AND MORGAN BOTH FOCUS ON "SHAREHOLDER INCENTIVES" IN THEIR TESTIMONY. CAN YOU EXPLAIN THE INCENTIVES PROVIDED FOR IN THE MECHANISMS?

A. Yes. S.C. Code Ann. § 58-37-20 explicitly requires the provision of "incentives and cost recovery" for DSM programs. The specific incentives to be provided were approved by the Mechanism Settlement Agreements entered into by ORS in December 2020, and they ensure that the utility is constantly looking out for, and implementing, DSM opportunities

that will lower customers' bills. It is important to note that the shared savings construct underlying the calculation of the Companies' performance incentive is tied to the Companies sharing only 10.6% of the net benefits calculated under the UCT. In other words, the performance incentive is merely a small portion of the resulting net benefits to the utility system, and the incentive motivates the Companies to maximize energy and peak capacity savings, while also minimizing the cost to achieve the savings. Clearly, the settling parties – including the ORS – and the Commission believed that maximizing net benefits, as defined by the UCT, should be the goal of the Companies with respect to EE and DSM programs, because that is what the Mechanisms incentivize. It is important to note, even after considering the Companies' authorized performance incentives that they may accrue, customers retain nearly 90% of the net benefits achieved by the Program.

V. HORII'S FREE-RIDERSHIP CALCULATIONS ARE INCORRECT AND MEANINGLESS.

Q. DO YOU AGREE WITH WITNESS HORII'S FREE-RIDERSHIP CALCULATIONS?

A. No. Witness Horii's calculations are inappropriate apples-to-oranges comparisons that render the analysis incorrect and uninformative. Witness Horii puts forth an analysis of free-ridership based on forecasted solar installations for DEC customers on rate RS before and after the change to the NEM tariffs. He contends that all of the forecasted 497 customers under the new Solar Choice Metering tariffs are free-riders when compared to the forecast of 633 customers under the old NEM tariffs. This analysis is fundamentally flawed as the Program proposed for DEC would not be available to customers on rate RS, but will instead only be available to customers with electric heating served under rate RE. In other words, Witness Horii is looking at the forecasted solar adoptions of customers who

cannot even participate in the proposed Program as the basis for estimating free-ridership of the Program.

Q. WITNESS HORII POINTS TO RESIDENTIAL SOLAR PV BEING "A WELL-ESTABLISHED TECHNOLOGY THAT HAS BEEN AROUND FOR DECADES" AS THE MAIN REASON WHY LOW MARKET UPTAKE AND, THEREFORE, LOW FREE-RIDER VALUES, ARE NOT APPLICABLE (PAGE 22, LINES 16-19). DO YOU AGREE WITH THAT ASSESSMENT?

A. There are a variety of factors that affect free-ridership. Mature technologies that have been around for decades AND that have successfully gained the customer acceptance required to become a market leader would likely have very high free-rider values. However, other product characteristics also play very important roles in this market transformation process, including initial cost, broad applicability, reliability, ease of use, low O&M costs, aesthetics, etc. For example, while residential solar PV "has been around for decades," it is not being implemented, or even considered, by most customers.

Witness Horii concedes that a 10% free-ridership assumption is appropriate "for programs that would have almost no market uptake without the incentive program." Horii Direct Testimony at p. 22, ll. 16-17. DEC has approximately 520,000 residential customers in South Carolina and DEP has approximately 147,000 residential customers in South Carolina. Based on the actual customer adoption of solar in 2020, a total of 1,559 residential customers across both utilities installed solar, which represents an adoption rate of 0.23% (or 0.0023). An adoption rate of 0.23% is incredibly low and is consistent with Mr. Horii's view of "almost no market uptake," making 10% an appropriate figure for free-ridership.

Q. WHY DOES WITNESS HORII'S FREE-RIDER ESTIMATE OF 79% OVERSTATE THE ANTICIPATED FREE-RIDERS?

A. Based on the 0.23% adoption rate of the Companies' customers in South Carolina of rooftop solar, it is clear that South Carolina customers are not clamoring to adopt solar PV. The Participant Cost Test score, even when considering over $8,400 in federal and state tax credits, suggests that the economics don't work for customers. While the proposed Program has a projected Participant Cost Test score of 0.97 and 1.09 for DEC and DEP respectively, without those tax credits, the Participant Cost Test fails by quite a large margin. Absent the Companies' proposed incentive in these proceedings in combination with federal and state tax credits, the economics do not support economically rational actors installing solar PV with the new Solar Choice Metering tariffs when on the RE rate. In fact, for these reasons, as well as the requirement to participate in a demand response program to qualify for the solar incentive, the Companies originally considered a zero free-ridership figure. Typically, demand response is considered a zero free-ridership program because customers are required to change their behavior to participate (i.e., they are unable to "free ride"). In determining the Companies' final free-ridership assumption, the Companies gave some consideration for a handful of outliers as the Companies did not want to be in a position of overstating benefits through a free-ridership assumption of zero, even if supportable. Just as is the case with any other EE/DSM program, the Companies will use Evaluation Measurement and Verification ("EM&V") to update the realized free-ridership as part of the overall net-to-gross ratio used to determine net saving impacts[5] for

[5] DOE's Uniform Methods Project (NREL 2014, Chapter 17) defines net savings impacts as "changes in energy use attributable to a particular energy efficiency program. These changes

cost recovery purposes. Consistent with established practice for new programs, the results will be applied back to the start of the Program. In other words, just as is the case with all EE/DSM programs, should EM&V determine a different free-ridership rate than the Companies have assumed, the annual EE/DSM Rider true up process will ensure that customers are only paying for the measured net energy savings associated with the Program.

VI. WITNESS MORGAN'S TESTIMONY IGNORES HOW EE/DSM PROGRAMS OPERATE AND THE BENEFITS OF EE/DSM PROGRAMS.

Q. DO YOU AGREE WITH WITNESS MORGAN'S CHARACTERIZATION OF THE PROGRAM?

A. No. Witness Morgan unduly focuses the costs of the Program, which fundamentally misrepresents how EE/DSM programs actually operate. For cost-effective EE/DSM programs, the utility is able to avoid more costs than it spends running the program. In other words, in spite of the costs that result from the EE/DSM program, more costs are avoided in other areas, including in electricity production, capacity, and T&D. Totally ignoring these benefits, as Witness Morgan does, misrepresents the value in implementing cost-effective EE/DSM programs. Witness Morgan's focus on the cost of demand-side resources would be no different from looking at the price tag associated with building a traditional supply-side resource, while completely ignoring the benefits associated with the reliable provision of electricity to customers. It begs the question as to why Witness Morgan did not simply evaluate the proposed Program with the UCT, which appropriately

may implicitly or explicitly include the effects of factors such as free-ridership, participant and non-participant spillover, and induced market effects"

places equal weight on both the utility system costs and utility system benefits that will be realized and enjoyed by customers.

VII. WITNESS MORGAN'S FOCUS ON "SUFFICIENT AND ADEQUATE" PROGRAMS MISSES THE POINT OF EE/DSM PROGRAMS.

Q. WITNESS MORGAN STATES THAT THE SOLAR CHOICE METERING TARIFFS ARE "SUFFICIENT AND ADEQUATE" FOR CUSTOMERS TO ADOPT RESIDENTIAL SOLAR. DO YOU AGREE?

A. No. "Sufficient and adequate" is not how the Companies approach EE/DSM programs. The Mechanism Settlement Agreements bind the Companies to "aggressively pursue DSM and EE savings." This is a commitment the Companies take seriously—as evidenced by the recognition the Companies have received for their EE/DSM programs—and the Companies are always looking for new opportunities to achieve cost-effective utility system savings for their customers. Because the Program will result in savings for all customers, the Companies are not satisfied with the "sufficient and adequate" Solar Choice Metering tariffs and instead recommend Commission approval of the Program proposed in these dockets.

Witness Morgan fails to recognize that the current rate design and compensation mechanism for customers with solar who are net-generators is ending and that the new offerings substantially change the economics for customers wishing to install solar PV on their homes. The Companies' proposed Program, which only recognizes the EE value of the reduced consumption from PV for customers also reducing their winter peak usage through required participation in the Winter BYOT Program, provides a separate and new value stream for customers considering investing in solar. As such, ignoring these significant changes renders his opinion moot since existing adoption rates do not reflect

future adoption rates with the new Solar Choice programs or the Companies' proposed Program.

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. Although solar PV has not previously been part of an approved EE program in South Carolina, the proposed Program is consistent with the treatment of other "non-traditional" measures like Topping Cycle CHP. Solar PV will reduce customer household energy consumption from the grid, while not reducing or impacting the residential home's function and therefore should be considered by the Commission as an EE measure. The Program is projected to be cost-effective under the UCT, which is the Commission-approved screening for determining whether a program is cost-effective and should be approved. Additionally, as discussed at length, although there is no requirement under the cost recovery mechanisms for programs to pass any other cost-effectiveness test but the UCT as a prerequisite for approval, the Program passes or comes very close to passing the other three tests, including the TRC test that appears to be preferred by Witness Horii. Finally, the Companies believe that they have shown that their assumed free-ridership of 10% is an appropriated initial assumption compare to the inflated and unjustified 79% supported by the ORS. Even if the measured free-ridership turns out to be different than the assumed 10%, the application of EM&V results in the annual rider true-up process will ensure that customers only pay for the measured net impacts confirmed through the EM&V study. For all of these reasons, the Commission should approve the proposed Program under the cost recovery mechanisms approved in the Mechanism Settlement Agreements.

Q. DOES THIS CONCLUDE YOUR PREFILED REBUTTAL TESTIMONY?

A. Yes, it does.

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EDUCATION

UNIVERSITY OF MICHIGAN — **Ann Arbor, MI**
University of Michigan Business School
Masters of Business Administration, May 2001

MICHIGAN STATE UNIVERSITY — **East Lansing, MI**
Eli Broad College of Business
Bachelor of Arts, General Business Administration, August 1996
Bachelor of Arts, Political Economics, May 1996

- Graduated with High Honors
- Member of Phi Beta Kappa, Phi Kappa Phi and Beta Gamma Sigma Honor Societies

EXPERIENCE

DUKE ENERGY

2021 – Present — **General Manager, Customer Regulatory Strategy and Evaluation** — **Charlotte, NC**

- Maintained prior responsibilities and added regulatory and reporting duties associated with technologies impacting the grid such as battery storage, electric transportation and distributed energy resources

2010 - 2021 — **General Manager, Customer Regulatory Strategy and Evaluation** — **Charlotte, NC**

- Managed the market analytics and financial performance functions associated with all retail product and service offerings.
- Accountable for gaining regulatory approval for all customer products and service offerings in six regulatory jurisdictions (Florida, Indiana, Kentucky, Ohio, and North & South Carolina).
- Responsible for creation and development of multiple regulatory incentive and recovery mechanisms business models associated with energy efficiency.
- Provided expert witness testimony in support of regulatory filings related to energy efficiency programs, cost recovery mechanisms/business models, and rate design.
- Regularly represented Duke Energy at industry forums and presents at conferences related to energy efficiency.
- Led collaborative engagements with external stakeholders associated with retail customer products and services.
- Led business unit-wide initiative to create, implement and integrate a cohesive regulatory strategy for Duke Energy's Retail Customer Products and Services Organization.

2006-2009 — **Managing Director, Federal Regulatory Policy Integration** — **Charlotte, NC**

- Directed effort to align federal and state regulatory initiatives into cohesive policy.
- Directed formulation of policy positions related to market power and industry consolidation.
- Led centralized effort to explore and potentially implement revenue decoupling across five different state regulatory jurisdictions.

2004-2006 — **Managing Director, Regulatory and Legislative Strategy** — **Cincinnati, OH**

- Performed regulatory due diligence for Duke/Cinergy merger.
- Negotiated with intervening parties to reach settlements in a multitude of regulatory matters.
- Developed and managed annual Regulatory Group budget of over $10 million.

2003 — **Senior Analyst in the Rates Department** — **Cincinnati, OH**

- Provided revenue requirement and rates analytic support for generation asset transfer between deregulated and regulated utility affiliates.
- Provided rate impact analysis of environmental compliance plans.

2001-2003 — **Senior Analyst at Miami Fort Station** — **North Bend, OH**

- Led station team responsible for harbor operation outsourcing decision.
- Provided analysis for decisions related to aspects of the Power Transfer Agreement.
- Performed various analytical tasks to assist the CFC and other station management.

1996-2001 — **FORD MOTOR COMPANY**

Budget Rent-a-Car Account Controller, 2001 — **Dearborn, MI**

- Budgeted, forecasted and reported actuals for all financials associated with the 2002 MY Program with Budget Rent-a-Car (Approximately 120,000 vehicles).
- Analyzed all special vehicle sales programs to Budget Rent-a-Car.

Marketing, Sales and Service Profit Analyst, 2000-2001 — **Dearborn, MI**

- Managed, forecasted and reported the Other Income and Expense Account, which consisted of over $50 million in costs in the 2000 Budget.
- Tracked and led efforts to reduce Marketing and Sales company vehicle inventory, which led to over a twenty-five percent reduction in 2000.

Visteon – IESD Profit Consolidator, 2000 **Dearborn, MI**

- Developed a Quarter over Quarter Financial Analysis Model.

Milan Plant - Operations Analyst, 1996-1999 **Milan, MI**

- Budgeted, forecasted and reported profits for the Fuel Tank SBU at Milan, which had over $300 million in sales in 1999.
- Developed a weekend and holiday-shutdown overtime forecasting model, which led to over a forty percent reduction in overtime costs.
- Led material cost reduction task force for that reported over $3 million of savings

1995 **GENERAL MOTORS – GMC TRUCK DIVISION** **Pontiac, MI**
Full-Size Truck Marketing Intern

OTHER

MIDWEST ENERGY EFFICIENCY ALLIANCE
Board of Directors - May, 2010 – May 2014

SOUTHEAST ENERGY EFFICIENCY ALLIANCE
Board of Directors - April, 2014- May 2019

BOY SCOUTS OF AMERICA
Eagle Scout

S.C. Code Ann. § 58-37-20

This document is current through 2021 Regular Session Act No. 116.

South Carolina Code of Laws Annotated by LexisNexis® > Title 58. Public Utilities, Services and Carriers (Chs. 1 — 41) > Chapter 37. Energy Supply and Efficiency (§§ 58-37-10 — 58-37-60)

§ 58-37-20. Public Service Commission; adoption of procedures encouraging energy efficiency and conservation.

The South Carolina Public Service Commission may adopt procedures that encourage electrical utilities and public utilities providing gas services subject to the jurisdiction of the commission to invest in cost-effective energy efficient technologies and energy conservation programs. If adopted, these procedures must: provide incentives and cost recovery for energy suppliers and distributors who invest in energy supply and end-use technologies that are cost-effective, environmentally acceptable, and reduce energy consumption or demand; allow energy suppliers and distributors to recover costs and obtain a reasonable rate of return on their investment in qualified demand-side management programs sufficient to make these programs at least as financially attractive as construction of new generating facilities; require the Public Service Commission to establish rates and charges that ensure that the net income of an electrical or gas utility regulated by the commission after implementation of specific cost-effective energy conservation measures is at least as high as the net income would have been if the energy conservation measures had not been implemented. For purposes of this section only, the term “demand-side activity” means a program conducted by an electrical utility or public utility providing gas services for the reduction or more efficient use of energy requirements of the utility or its customers including, but not limited to, utility transmission and distribution system efficiency, customer conservation and efficiency, load management, cogeneration, and renewable energy technologies.

History

1992 Act No. 449, Part IV § 1, eff July 1, 1992; *1997 Act No. 26, § 2*, eff May 21, 1997.

Annotations